

LISTING OF ALL CLAIMS

Claim 1 (Amended) A polishing apparatus comprising:

a turntable;

an abrasive cloth mounted on an upper surface of said turntable;

a top ring disposed above said turntable for supporting a workpiece to be polished and pressing the workpiece against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the workpiece pressed by said top ring against said abrasive cloth, during which polishing at least one area of the surface of the workpiece tends to be polished more intensively at a higher polishing rate than at least one other area of the surface of the workpiece, thus tending to create polishing irregularities on the surface of the workpiece; and

said abrasive cloth having [an actuatable region] actuatable regions individually and independently operable to be selectively caused to form therein recesses [a recess], and said [recess] recesses being located at [a position] positions relative to said top ring to come into contact with the at least one area of the surface of the workpiece and thus forming means to perform less intensive polishing of the at least one area, while regions [a region] of said abrasive cloth other than at said [recess is] recesses are operable to contact the at least one other area of the surface of the workpiece to perform a more intensive polishing thereof, and thereby to correct the polishing irregularities.

Claim 2 (Amended) A polishing apparatus according to claim 1, wherein said positions [position] of said [recess is] recesses are selectable in a radial direction of said turntable.

Claim 3 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished less intensively at a lower polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer more intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

cavities defined in said upper surface of said turntable;

members mounted in said cavities for movement therein to positions to project above said upper surface of said turntable and to cause portions of said abrasive cloth to project upwardly as a projecting regions;

said projecting regions each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said projecting regions being located at positions relative to said top ring to come into greater contact with the areas of the surface of the wafer than with the at least one other area of the surface of the wafer; and

said members being individually and independently operable.

Claim 4 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished less intensively at a lower polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer more intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

cavities defined in said upper surface of said turntable;

means for supplying compressed air into said cavities to cause portions of said abrasive cloth to project upwardly above said upper surface of said turntable as projecting regions;

said projecting regions each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said projecting regions being located at positions relative to said top ring to come into greater contact with the areas of the surface of the wafer than with the at least one other area of the surface of the wafer; and

said projecting regions being individually and independently operable.

Claim 5 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished more intensively at a higher polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer less intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

cavities defined in said upper surface of said turntable;

members mounted in said cavities for movement therein to positions inwardly of said upper surface of said turntable and to form recesses therein;

said recesses each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said recesses being located at positions relative to said top ring to come into greater contact with the areas of the surface of the wafer than with the at least one other area of the surface of the wafer; and

said members being individually and independently operable.

Claim 6 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished less intensively at a lower polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer more intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

a surface of said abrasive cloth having a non-projecting region and projecting regions extending upwardly from said non-projecting region;

said projecting regions each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said projecting regions having a height and being located at positions relative to said top ring to come into contact with the areas of the surface of the wafer, while said non-projecting region comes into contact with the at least one other area of the surface of the wafer; and

said projecting regions being individually and independently operable to project above said non-projecting region.

Claim 7 (Original) A polishing apparatus according to claim 6, wherein said abrasive cloth has a plurality of projecting regions, at least one of number or size on said projecting regions being selectable.

Claim 8 (Original) A polishing apparatus according to claim 6, wherein said projecting region has an adjustable height.

Claim 9 (Original) A polishing apparatus according to claim 6, wherein an upper surface of said turntable has a projecting region forming said projecting region of said abrasive cloth.

Claim 10 (Original) A polishing apparatus according to claim 6, wherein said projecting region has a circular shape.

Claim 11 (Original) A polishing apparatus according to claim 6, wherein said projecting region is annular.

Claim 12 (Original) A polishing apparatus according to claim 6, wherein said position of said projecting region is selectable in a radial direction of said turntable.

Claim 13 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished more intensively at a higher polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer less intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

recesses formed in said upper surface of said turntable, said recesses being covered by said abrasive cloth;

said recesses each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said recesses being located at positions relative to said top ring such that portions of said abrasive cloth covering said recesses come into contact with the areas of the surface of the wafer, while a region of said abrasive cloth other than said portions covering said recesses comes into contact with the at least one other area of the surface of the wafer; and

said portions of said abrasive cloth covering said recesses being individually and independently operable.

Claim 14 (Original) A polishing apparatus according to claim 13, wherein said turntable has a plurality of recesses, at least one of number and size of said recesses being selectable.

Claim 15 (Original) A polishing apparatus according to claim 13, wherein said recess has an adjustable depth.

Claim 16 (Original) A polishing apparatus according to claim 13, wherein said recess has a circular shape.

Claim 17 (Original) A polishing apparatus according to claim 13, wherein said recess is annular.

Claim 18 (Original) A polishing apparatus according to claim 13, wherein said position of said recess is selectable in a radial direction of said turntable.

Claim 19 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing areas of the surface of the wafer tend to be polished less intensively at a lower polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the areas of the surface of the wafer more intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

said abrasive cloth having a non-projecting region and actuatable regions operable to be selectively caused to project upwardly from said non-projecting region as projecting regions;

said projecting regions each having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring;

said projecting regions each having a height and being located at positions relative to said top ring to come into contact with the areas of the surface of the wafer, while said non-projecting region comes into contact with the at least one other area of the surface of the wafer; and

said actuatable regions being individually and independently operable.

Claim 20 (Original) A polishing apparatus according to claim 19, wherein said position of said projecting region is selectable in a radial direction of said turntable.

Claim 21 (Original) An apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

a turntable having an abrasive cloth mounted on an upper surface thereof;

a top ring disposed above said turntable for supporting a wafer to be polished and for pressing the wafer against said abrasive cloth, said top ring having a lower wafer-holding area against which the wafer is held during pressing thereof against said abrasive cloth;

moving means for moving said turntable and said top ring relative to each other, thereby to cause said abrasive cloth supported by said turntable to polish a surface of the wafer pressed by said top ring against said abrasive cloth, during which polishing at least one area of the surface of the wafer tends to be polished more intensively at a higher polishing rate than at least one other area of the surface of the wafer, thus tending to create polishing irregularities on the surface of the wafer; and

means for polishing the at least one area of the surface of the wafer less intensively than the at least one other area of the surface of the wafer and thereby to correct the polishing irregularities thereof, said means comprising:

an annular recess formed in said upper surface of said turntable, said recess being covered by said abrasive cloth;

said annular recess having a dimension in a radial direction of said turntable that is smaller than a diameter of said wafer-holding area of said top ring; and

said annular recess being located at a position relative to said top ring to come into contact with the at least one area of the surface of the wafer, while a region of said abrasive cloth other than that covering said annular recess comes into contact with the at least one other area of the surface of the wafer.

Claim 22 (Amended) A polishing apparatus for polishing a semiconductor wafer to a flat mirror finish, said apparatus comprising:

an abrasive cloth having a contact surface which contacts a surface of a wafer to be polished during polishing; [and]

a top ring for supporting the wafer and pressing the wafer against said abrasive cloth; and

moving means for moving a plurality of portions of said abrasive cloth to be higher than another portion of said abrasive cloth so that [wherein a] said plurality of portions of said abrasive cloth are individually and independently pressed against the wafer by air pressures.

Claim 23 (Previously Presented) A polishing apparatus according to claim 22, further comprising a plurality of passages supplying the air pressures to said plurality of portions and being connected to respective regulators;

wherein said regulators control individually and independently the air pressures.

Claim 24 (Previously Presented) A polishing apparatus according to claim 23, further comprising a plurality of cavities corresponding to said plurality of portions of said abrasive cloth and connected to said passages respectively.

Claim 25 (Previously Presented) A polishing apparatus according to claim 22, wherein said abrasive cloth is pressed against the wafer by air pressure through a thin plate.

Claim 26 (Canceled)